

Well Name: **Heinricy 7KDU**

Surface Location: Heinricy Pad Sec.7-T5N-R67W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4980.0

+N/-S +E/-W
 0.0 0.0

Northing
 1395340.77

Easting
 3155966.82

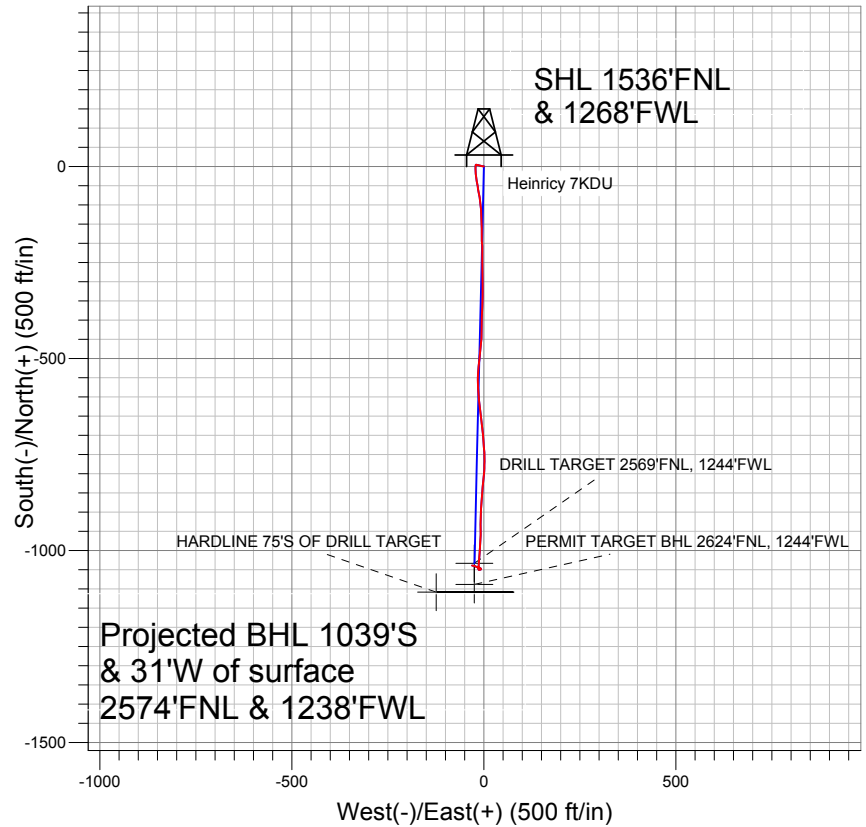
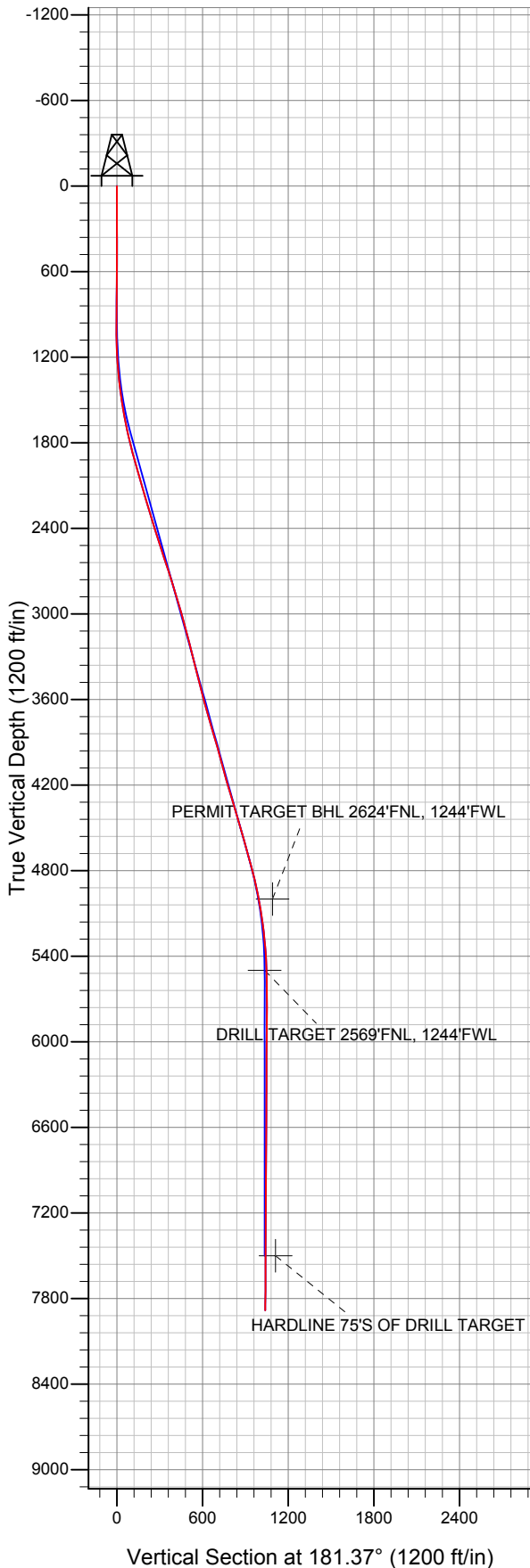
Latitude
 40.417260

Longitude
 -104.939850

Slot

Original Well Elev WELL @ 4993.0ft (Original Well Elev)

PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- Heinricy 7KDU, Wellbore #1, Plan #2 (10-05-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 8022'MD & 7884'TVD @ 1040'VS
 0.9 deg Inc 280.2 deg AZ

Project: SEC.7-T5N-R67W
 Site: Heinricy Pad Sec.7-T5N-R67W
 Well: Heinricy 7KDU
 Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.7-T5N-R67W

Heinricy Pad Sec.7-T5N-R67W

Heinricy 7KDU

Wellbore #1

Survey: Survey #1

Standard Survey Report

13 October, 2011

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7KDU
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4993.0ft (Original Well Elev)
Site:	Heinricy Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4993.0ft (Original Well Elev)
Well:	Heinricy 7KDU	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.7-T5N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Heinricy Pad Sec.7-T5N-R67W			
Site Position:		Northing:	1,395,340.92 ft	Latitude:	40.417260
From:	Lat/Long	Easting:	3,155,989.09 ft	Longitude:	-104.939770
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.36 °

Well	Heinricy 7KDU					
Well Position	+N-S	0.0 ft	Northing:	1,395,340.77 ft	Latitude:	40.417260
	+E-W	0.0 ft	Easting:	3,155,966.82 ft	Longitude:	-104.939850
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,980.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/15/2010	9.05	67.06	53,190

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	5,500.0	0.0	0.0	181.37	

Survey Program	Date	10/13/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
252.0	8,022.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
252.0	0.50	280.00	252.0	0.2	-1.1	-0.2	0.20	0.20	0.00	
494.0	1.00	280.00	494.0	0.7	-4.2	-0.6	0.21	0.21	0.00	
711.0	1.75	280.00	710.9	1.6	-9.3	-1.4	0.35	0.35	0.00	
958.0	2.60	287.50	957.7	4.0	-18.4	-3.5	0.36	0.34	3.04	
1,053.0	0.50	240.70	1,052.7	4.4	-20.8	-3.9	2.41	-2.21	-49.26	
1,148.0	2.50	190.20	1,147.7	2.2	-21.5	-1.7	2.33	2.11	-53.16	
1,243.0	4.50	183.00	1,242.5	-3.6	-22.1	4.1	2.15	2.11	-7.58	
1,338.0	5.60	175.10	1,337.1	-11.9	-21.9	12.4	1.37	1.16	-8.32	
1,433.0	7.70	174.40	1,431.5	-22.9	-20.9	23.4	2.21	2.21	-0.74	
1,528.0	9.10	168.30	1,525.4	-36.6	-18.7	37.0	1.74	1.47	-6.42	
1,623.0	10.40	172.60	1,619.1	-52.4	-16.1	52.8	1.57	1.37	4.53	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7KDU
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4993.0ft (Original Well Elev)
Site:	Heinricy Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4993.0ft (Original Well Elev)
Well:	Heinricy 7KDU	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,718.0	12.50	170.40	1,712.2	-71.1	-13.3	71.4	2.26	2.21	-2.32
1,813.0	13.80	170.70	1,804.7	-92.4	-9.7	92.6	1.37	1.37	0.32
1,908.0	15.90	176.20	1,896.5	-116.6	-7.0	116.7	2.66	2.21	5.79
2,003.0	16.30	179.80	1,987.8	-142.9	-6.1	143.0	1.13	0.42	3.79
2,097.0	15.50	179.90	2,078.2	-168.6	-6.1	168.7	0.85	-0.85	0.11
2,192.0	15.80	176.30	2,169.7	-194.2	-5.2	194.3	1.07	0.32	-3.79
2,287.0	16.00	180.00	2,261.0	-220.2	-4.4	220.3	1.09	0.21	3.89
2,382.0	17.50	179.90	2,352.0	-247.6	-4.4	247.6	1.58	1.58	-0.11
2,477.0	18.30	178.90	2,442.4	-276.8	-4.0	276.8	0.90	0.84	-1.05
2,572.0	18.90	179.20	2,532.4	-307.1	-3.5	307.1	0.64	0.63	0.32
2,667.0	18.00	181.40	2,622.6	-337.2	-3.7	337.1	1.20	-0.95	2.32
2,762.0	17.10	182.20	2,713.1	-365.8	-4.6	365.8	0.98	-0.95	0.84
2,857.0	17.10	180.70	2,803.9	-393.7	-5.3	393.7	0.46	0.00	-1.58
2,951.0	16.70	181.50	2,893.9	-421.0	-5.8	421.0	0.49	-0.43	0.85
3,046.0	15.40	182.40	2,985.2	-447.3	-6.7	447.3	1.39	-1.37	0.95
3,141.0	15.90	186.70	3,076.7	-472.8	-8.7	472.9	1.33	0.53	4.53
3,236.0	15.20	186.00	3,168.2	-498.1	-11.6	498.2	0.76	-0.74	-0.74
3,330.0	13.50	185.00	3,259.2	-521.3	-13.8	521.5	1.83	-1.81	-1.06
3,425.0	13.70	183.70	3,351.6	-543.6	-15.5	543.8	0.38	0.21	-1.37
3,520.0	14.20	178.70	3,443.8	-566.4	-16.0	566.7	1.37	0.53	-5.26
3,615.0	14.70	175.20	3,535.8	-590.1	-14.7	590.3	1.06	0.53	-3.68
3,710.0	15.40	172.00	3,627.5	-614.6	-11.9	614.7	1.14	0.74	-3.37
3,805.0	16.10	174.20	3,718.9	-640.2	-8.8	640.2	0.97	0.74	2.32
3,900.0	16.70	174.00	3,810.1	-666.9	-6.1	666.8	0.63	0.63	-0.21
3,995.0	16.50	174.30	3,901.1	-693.9	-3.3	693.8	0.23	-0.21	0.32
4,089.0	15.00	174.20	3,991.6	-719.3	-0.8	719.1	1.60	-1.60	-0.11
4,184.0	15.20	178.00	4,083.3	-744.0	0.9	743.7	1.06	0.21	4.00
4,279.0	15.20	180.10	4,175.0	-768.9	1.3	768.6	0.58	0.00	2.21
4,374.0	17.10	182.80	4,266.2	-795.3	0.6	795.0	2.15	2.00	2.84
4,469.0	17.60	187.10	4,356.9	-823.5	-1.8	823.3	1.45	0.53	4.53
4,564.0	15.60	185.10	4,448.0	-850.4	-4.7	850.3	2.19	-2.11	-2.11
4,659.0	15.60	183.10	4,539.5	-875.9	-6.6	875.8	0.57	0.00	-2.11
4,753.0	15.70	182.70	4,630.0	-901.2	-7.8	901.2	0.16	0.11	-0.43
4,848.0	15.60	180.00	4,721.5	-926.9	-8.5	926.8	0.77	-0.11	-2.84
4,943.0	14.60	180.20	4,813.2	-951.6	-8.5	951.5	1.05	-1.05	0.21
5,038.0	12.30	183.40	4,905.6	-973.7	-9.1	973.6	2.54	-2.42	3.37
5,133.0	10.50	183.60	4,998.7	-992.4	-10.3	992.4	1.90	-1.89	0.21
5,150.9	10.25	183.80	5,016.3	-995.6	-10.5	995.6	1.39	-1.37	1.13
PERMIT TARGET BHL 2624'FNL, 1244'FWL									
5,228.0	9.20	184.80	5,092.3	-1,008.6	-11.5	1,008.6	1.39	-1.37	1.29
5,323.0	7.40	181.50	5,186.3	-1,022.3	-12.3	1,022.3	1.96	-1.89	-3.47
5,418.0	5.80	184.80	5,280.7	-1,033.2	-12.8	1,033.2	1.73	-1.68	3.47
5,512.0	4.20	190.70	5,374.3	-1,041.3	-13.9	1,041.4	1.79	-1.70	6.28
5,607.0	2.50	184.00	5,469.1	-1,046.8	-14.6	1,046.9	1.83	-1.79	-7.05
5,637.3	2.09	172.37	5,499.4	-1,048.0	-14.6	1,048.1	2.04	-1.36	-38.33
DRILL TARGET 2569'FNL, 1244'FWL									
5,702.0	1.70	133.20	5,564.1	-1,049.9	-13.8	1,049.9	2.04	-0.60	-60.58
5,797.0	1.40	75.30	5,659.0	-1,050.5	-11.6	1,050.5	1.60	-0.32	-60.95
5,892.0	1.00	68.60	5,754.0	-1,049.9	-9.7	1,049.9	0.45	-0.42	-7.05
5,987.0	0.60	60.20	5,849.0	-1,049.4	-8.5	1,049.3	0.44	-0.42	-8.84
6,082.0	0.40	63.80	5,944.0	-1,049.0	-7.8	1,048.9	0.21	-0.21	3.79
6,177.0	0.30	36.30	6,039.0	-1,048.6	-7.3	1,048.5	0.20	-0.11	-28.95
6,272.0	0.20	357.00	6,134.0	-1,048.3	-7.2	1,048.1	0.20	-0.11	-41.37

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,367.0	0.30	338.50	6,229.0	-1,047.9	-7.3	1,047.7	0.13	0.11	-19.47
6,462.0	0.40	317.60	6,324.0	-1,047.4	-7.6	1,047.3	0.17	0.11	-22.00
6,557.0	0.50	306.60	6,419.0	-1,046.9	-8.2	1,046.8	0.14	0.11	-11.58
6,652.0	0.60	297.60	6,514.0	-1,046.4	-8.9	1,046.3	0.14	0.11	-9.47
6,747.0	0.70	298.20	6,609.0	-1,045.9	-9.9	1,045.9	0.11	0.11	0.63
6,842.0	0.70	305.60	6,704.0	-1,045.3	-10.9	1,045.3	0.10	0.00	7.79
6,937.0	0.60	311.80	6,799.0	-1,044.6	-11.7	1,044.6	0.13	-0.11	6.53
7,032.0	1.40	271.70	6,894.0	-1,044.3	-13.3	1,044.3	1.07	0.84	-42.21
7,127.0	1.70	280.20	6,988.9	-1,044.0	-15.8	1,044.1	0.40	0.32	8.95
7,222.0	1.50	292.90	7,083.9	-1,043.3	-18.3	1,043.4	0.43	-0.21	13.37
7,317.0	1.30	295.90	7,178.9	-1,042.3	-20.4	1,042.5	0.22	-0.21	3.16
7,412.0	1.00	297.40	7,273.8	-1,041.4	-22.2	1,041.7	0.32	-0.32	1.58
7,507.0	1.00	295.40	7,368.8	-1,040.7	-23.6	1,041.0	0.04	0.00	-2.11
7,603.0	1.00	283.10	7,464.8	-1,040.2	-25.2	1,040.5	0.22	0.00	-12.81
7,639.6	0.96	280.07	7,501.4	-1,040.0	-25.8	1,040.4	0.18	-0.11	-8.27
HARDLINE 75'S OF DRILL TARGET									
7,698.0	0.90	274.70	7,559.8	-1,039.9	-26.8	1,040.3	0.18	-0.10	-9.20
7,793.0	0.70	286.10	7,654.8	-1,039.7	-28.1	1,040.1	0.27	-0.21	12.00
7,888.0	0.70	281.70	7,749.8	-1,039.4	-29.2	1,039.8	0.06	0.00	-4.63
7,983.0	0.90	280.20	7,844.8	-1,039.2	-30.5	1,039.6	0.21	0.21	-1.58
8,022.0	0.90	280.20	7,883.8	-1,039.1	-31.1	1,039.5	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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